Mosa Project Documentation

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Contents

MOSA is an open source software project that natively executes .NET applications within a virtual hypervisor or on bare metal hardware!

The MOSA project consists of:

- Compiler - a high quality, multithreaded, cross-platform, optimizing .NET compiler
- Kernel - a small kernel operating system
- Device Drivers Framework - a modular, device drivers framework and device drivers
- Debugger - QEMU-based debugger

CHAPTER 1

Current Status

The target platforms are:

- Intel X86/32-bit (stable)
- Intel X64 (in development)
- ARM v6 (in early development)

The MOSA compiler supports nearly all and object oriented non-object oriented code, including:

- Generic Code (example: List<T>)
- Delegates (static and non-static) and with optional parameters
- Exception Handling (try, finally, and catch code blocks)

The MOSA compiler seeks to provide high quality code generation using the following optimizations:

- Constant Folding and Propagation
- Strength Reduction optimization
- Dead Code Elimination
- Single Static Assignment (SSA)
- Global Value Numbering / Common Subexpession Elimination
- Sparse Conditional Constant Propagation
- Inlined Expansion
- Loop-Invariant Code Motion
- Block Reordering
- Greedy Register Allocation

CHAPTER 2

Getting Started

2.1 Download

The MOSA project is available as a zip download or via git:

```
git clone https://github.com/mosa/MOSA-Project.git
```

2.2 Prerequisites

You will also need the following prerequisites:

2.2.1 Windows

Install any Visual Studio version 2018 or newer. All editions are supported including the fully-featured free Community Edition.

Note: The MOSA source code repository includes Qemu virtual emulator for Windows.

The CodeMaid Visual Studio Extension is strongly recommended for MOSA contributors.

2.2.2 Linux

Install Mono and Qemu.

The minimum supported version of Mono is 5.16.

If using the APT package manager you can use the following command to quickly set up QEMU and Mono

```
sudo apt-get -y install mono-devel qemu
```

2.2.3 Mac

Install Mono and Qemu.

2.3 Running

2.3.1 Windows

Double click on the "Compile.bat" script in the root directory to compile all the tools, sample kernels, and demos.

Next double click on the "Launcher.bat" script, which will bring up the MOSA Launcher tool (screenshot below) that can:

- Compile the operating system
- Create a virtual disk image, with the compiled binary and boot loader
- Launch a virtual machine instance (QEMU by default)

By default, the CoolWorld operating system demo is pre-selected. Click the "Compile and Run" button to compile and launch the demo.

CHAPTER 3

Join the Discussion

Join us on Gitter chat. This is the most interactive way to connect to MOSA's development team.

CHAPTER 4

License

MOSA is licensed under the New BSD License.